" Feasibility study of biofloc technology for sustainable aquaculture in Parbhani district of Maharashtra."

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Synopsis

Submitted to

Swami Ramanand Teerth Marathwada University, Nanded (MS.)

For the registration of

Doctor of Philosophy

In

Zoology

(Faculty of Science & Technology)

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2022-2023

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Introduction

Aquaculture is farming in water so the water is very important resource for cultivation of aquatic organisms. Water is one of the most vital resource for all kinds of life on this planet is also the resource, adversely affected qualitatively and quantitatively by all kinds of human activities on land in air, or in water. It occupies 71% of earth's surface. Actually, the name "Earth" for our planet is misnomer because the land part of our planet is only 29% the remaining 71% being water. Early human used these resources to satisfy their needs for air, water, food and shelter. These natural resources were radially available in the biosphere. The human beings are used this resources for different purposes such as aquaculture, agriculture, industry and human existence.

The World Aquaculture Society (WAS) was founded in 1969 as the world Mariculture Society. Since its beginning the membership in WAS has grown to more than 3,000 members in about 100 countries representing the global aquaculture community. In order to meet the expanding international nature of the society and to address specific needs in various areas of the world, the WAS has created chapters in the United States, Japan, Korea, Latin American and Caribbean region, Asian-Pacific region and most recently in Africa. Aquaculture will have to play an increasingly important role in meeting the global demand for fisheries products as the world population continues to expand and fisheries stocks approach their biological limits. Although worldwide aquaculture production reached all time high of 114.5 million metric tons valued at $263.6 billion (US$) in 2018, aquaculture production will have to continue to expand to meet world demand for fisheries products. Aquaculture will also play an important role in economic and community development throughout the world as the world moves to a more global economy. The progressive development and expansion of Aquaculture will be dependant on the generation, dissemination, and adoption of knowledge and technology consistent with broad societal, national and international goals (www.was.org.in).

India is the world's second-largest Aquaculture nation and the third-largest fish producer after china. The Indian Blue Revolution has led to a major improvement the fishing and aquaculture industries. The industries are regarded as sunrise sectors and are anticipated to have a big impact on the Indian economy. Indian fisheries have recently seen a paradigm shift from inland to marine-dominated fisheries and, with the later becoming a major contributor to fish output, from 36% in the middle of the 1980s to 70% in the recent past. While inland fisheries and aquaculture has increased in absolute terms, their potential has not been fully realised. The 191,024km of rivers and canals, 1.2 million ha of floodplain lakes, 2.36 million ha of ponds and tanks, 3.54 million ha of reservoirs, and 1.24 million ha of brackish water resources –vast, underutilised resources offer excellent opportunities for

increased production, creation of livehoods, and emergence of economic prosperity (www.investindia.gov.in).

In Maharashtra state offers an excellent opportunity in fisheries sector perticulraly in fresh water fisheries (Inland fisheries) sector because of the large fresh water resources of Maharashtra. It includes 19,456 km rivers and canals and 3,77,905 ha of ponds and reservoirs and 12,445 ha of brackish water land area which is suitable for shrimp culture (Amol Sonone, Satayjit B. Belsare & Sagar A. Joshi; June 2020). The fish farming industry in Maharashtra is advocating for recognition as "farmers" in order to qualify for lower Goods and Services (GST) rates when exporting seafood and realted products. In Maharashtra commercial fish farming is a lucrative and accessible business venture, as there are numerous fast-growing species available. This allow for a quick return on investment .With an annual increase in the consumption of fish, it is crucial to promote responsible harvesting and prevent the depletion of natural species . Fish farming provides a sustainable way to protect species and conserve natural resources. Maharashtra has a large population,and fish is a popular food item.The demand for fish in maharashtra is high, and it presents an opportunity for fish farmers to supply the market with fresh and locally produced fish. In Maharashtra has a wide range of diverse water resources, including rivers, lakes, ponds and groundwater wells, providing ample opportunities for fish farming. This diversity of water resources can allow fish farmers to choose the suitable water source for their operations. Maharashtra's tropical climate is suitable for many fish species, including catfish, carp, tilapia, and rohu. The warm temperatures and abundant rainfall support growth and reproduction of fish ,making it an ideal location for fish farming(www.krushimantri.com). Aquatic resources are exploited only at minimum level and to achive blue revolution. We need technologies and awareness on Aquaculture.

Biofloc Technology (BFT) is considered as new 'Blue Revolution' since nutrients can be continuously recycled and reused in the culture medium , benifeted by the minimum zero-water exchange . BFT is an environment friendly Aquaculture technique based in in-situ microorganism production. Biofloc is the suspended growth in ponds/tanks which is the aggregates of living and dead particulate organic matter, phytoplankton, bacteria and grazers of the bacteria's. It is the utilization of microbial processes within the pond/tank itself to provide food resource for cultured organism while at the same time acts as a water treatment remedy. Thus, this system is also called as active suspension ponds or heterotrophic ponds or even green soup ponds. The global population is expected to reach 9.6 billion by yr.2050 and as the demand for animal protein is increasing year by year it is a challenge to provide quality protein by safeguarding its natural resources for future generations. In this context, aquaculture plays a key role in promoting health by providing animal protein as well as generating employment and economic growth (www.nfdb.gov.in). Biofloc technology is a sustainable aquaculture practice that involves the development of microbial communities within the water column that help to convert waste products from fish and other aquatic organisms into a food source for the animals themselves. This technology has gained

popularity in recent years due to its ability to reduce the need for costly external feed and its potential to enhance the growth and health of fish. The feasibility of implementing biofloc technology in the Parbhani district of Maharashtra depends on several factors, including the availability of suitable water resources, the economic viability of the technology, and the willingness of local farmers to adopt this practice.

Firstly, the availability of suitable water resources is a crucial factor in the success of biofloc technology. This includes access to a reliable source of freshwater with a stable temperature and pH level, as well as the absence of contaminants such as pesticides or heavy metals. Therefore, a thorough analysis of the water quality in Parbhani district should be conducted before implementing this technology. Secondly, the economic viability of the technology should be evaluated, taking into account the cost of setting up and maintaining a biofloc system. This may include the cost of infrastructure such as tanks, aerators, and biofilters, as well as the cost of purchasing and maintaining a supply of probiotics and other inputs. Additionally, the potential income generated from the sale of fish or other aquatic organisms should be considered. Lastly, the willingness of local farmers to adopt this practice is an important factor in the feasibility of biofloc technology in Parbhani district. This may involve educating farmers on the benefits of biofloc technology and providing training and support to help them implement and manage a biofloc system. In conclusion, while biofloc technology has the potential to be a sustainable and economically viable practice for aquaculture in Parbhani district, a thorough feasibility study should be conducted to assess the availability of suitable water resources, the economic viability of the technology, and the willingness of local farmers to adopt this practice.

Literature Review

In 2016, FAO (Food and Agriculture organization) of the United Nations was found that, Fisheries and Aquaculture remains the important sources of Aqua food, nutrition, income and generates employment. It also earns foreign exchange. Their was hundreds of millions of people around the world. world per capita fish supply reached a new record high of 20kg in 2014, because of the vigrous growth in Aquaculture, Now which provides half of all fish for the human consumption and to a slight improvement in the state of certain fish stocks due to improvement in the fisheries management sectors. In 2008, it was found that capture fisheries and Aquaculture supplied the world with about 142 millions tonnes of fish. of this, 115 million tonnes was used as human food, Providing an estimated apparent per capita supply of about 17 kg which is an all-time high (2013,Suresh K. Rao and Sanjana Rawat). In 2007, fish accounted for 15.7 % of the global populations intake of animal protein and 6.1% of all protein consumed (2016,suresh k. rao and sanjana rawat). In India fish farming is a popular business. So there is a need of new cucltural Practices can be adopted in the Aquaculture farming. In Sustainable aquaculture development, Their was prospects of Biofloc technology (BFT) for Aqua farming during the past 20 years, global aquaculture enterprise has succeeded and continues to increase while achieving the critical globals of environmental,

economic and societal sustainability (June 2020). Aquaculture is the fastest- growing food-production technology, now globally accounting for more fish biomass than capture fisheries if non-edible amounts are included (Edwards, zhang, Belton, and Little, 2019) and more total biomass than beef.

BFT allows good pond management by minimal of zero water exchange with abuandant microbial populations based on a balance of carbon: nitrogen (C:N) ratio in water (Cadiz et al., 2016, Lee et al., 2017, panigrahi et. al, 2019). BFT can maintain the water quality as it is rich in organic matter [biomass] (Abdel- Fattah M.E 1-sayed, 2020). The Bioflocs in the BFT system are formed by the aggregation of many substances, including microorganisms, microalgae, Zooplankton and trapped organic particles or solids from inedible feed (Lee et. al, 2017). This is consumed by the bacteria Communities with added probiotics (Aguilera- Rivera et al., 2019). In Aquacultural farming of a Aquatic animals their was water plays a vital role in Aquatic lifes. Their was some physico-chemical and Biological parameters of water can be Analyzed by, Standard method as prescribed by APHA (1989) were used for estimation of various parameters and compared with WHO and ISI, found with the limit or below water quality and Biodiversity of planktonic flora and fauna and zoobenthos.

Background

Aquaculture is a rearing of food animals in water; aquatic animals like prawns, fishes, edible molluscs, crabs, lobstres, frogs are cultured in specially designed habitat like culture pond, cages, raceway culture, pen culture, wet lands and Integrated fish farming etc . Perticullarly in a successful aquaculture practices are needs to study the habitat, food and feeding habitat, behaviour, growth, reproduction aspects and harvesting of fishes, preservation methods and processing etc. These animals ate cultured in small area in short time and it is possible to get high productivity yeilds and more benefits.

Now a days besides the routine fish culture practice, like Polyculture, intensive, Extensive and semi-intensive type of methods are used in cultural practices and to acheive more production. Awareness in aquaculture can be need of new technologies to acheive a blue revolution. In aquacluture the world's is largest producer. According to Food and Agriculture organization (FAO) as the production of crustaceans, molluscs, fishes, and marine plants are processed into products for human consumption, especially as seafood. Aquaculture becomes popular business and method ,So that today 50% of seafood produced. Aquaculture business branched out to include algaeculture, mariculture, Shrimp farming, 0yster farming , fish farming and ornamental fish culture. China is the runway leader when it comes to farming high value in addition to traditional aquatic flora and fauna for human consumption with 63.7 million metric tons produced. These aquatic animals are sold live as Preferred by consumers in china. Indonesia produces about 16.6 million metric tons of aquaculture produces annually. About 28% of Indonesia's aquatic animal farming was integrated with rice fish farming. India Produces 5.7 million meteric tons of a aquatic produce annually. India has not fully realized its potential as aquatic farming producer with only a small

area of land resources used. Bangladesh puts out about 2.2 million metric tons of aquaculture produce annually Shrimp culture leads aquaculture farming in Bangladesh. South korea has an annual aquaculture produce of 1.9 million meteric tons. See weed tops aquaculture farming followed by mollusks and fin fish in south korea in accordance of National institutes of health government (www.ncbi.nlm.nih.gov.in). The basic technology was developed by Professor Yoram Avnimelech in Israel and Initially implemented in commercial shrimp culture in Belize by Robins McIntosh. Biofloc Technology (BFT) has become a popular in the farming of pacific white shrimp (Litopenaeus vannamei). It also has been applied with success at Shrimp farms in Idonesia and malaysia by the author (by Nyan Tow, ph.d. Sep. 2012). The combination of two technologies partial harvesting and biofloc has been Studied in northern Sumatra, Indonesia. The system has also been successfully incorporated with biosecure modular culture system. This latter combination can make operations much more Sustainable and economically viable (Nyan Taw, Ph.D Sep. 2012).

Biofloc technology is a technique of enhancing water quality through the addition of extra carbon to the aquaculture System through an external carbon source or elevated carbon content of the feed. This promoted nitrogen uptake by bacterial growth, decreasing the ammonia concentration more rapidly than nitrfication. The first Biofloc technolgy (BFT) was developed in the 1970s at Ifremer Cop (French Research Institute for Exploitation of the sea, oceanic center of pacific) with penaus monodon, fenneropenaeus merguiensis, Liptopenaeus vannamei and L. stylirostris (Oct 2022). The father of biofloc fish farming was Prof. Yoram Avnimelech, an Israeli environmentalist in the 70's to promote a more sustainable mode of fish farming. In the past few decades, Biofloc has become increasingly popular all across the world, including India (Dec 2022). In biofloc their is presence of Halomonas sp. and Bacillus sp. In all stages biofloc formation reinforces the need for new development regarding the ability of these species to be used as inoculum in farming biofloc rapidly. The reuse water from BFT systems used to establish new biofloc culture prolongs the useful life of the water and reduces overall water consumption (Feb 2019). In BFT main water quality parameters are temperature ranges 28-30 ˚c (ideal for tropical species), PH is 6.8-8.0, salinity depends on the cultured Species and TAN less than 1mgL¯(ideal) and dissolved oxygen (DO) is above of 4.0 mg L-1(ideal) and at least 60% of saturation (Jan 2017, Hlanganani Tutu). Thus Biofloc fish farming in India offers benefits improving aquaculture production that could contribute to the achievement of Sustainable development goals. This techonology could result in higher Productivity with less impact to the environment.

Hypothesis

Aquaculture is most popular business in world and also in India. The demand of animal protein increasing year by year so it is a challenge to future generations to provide a quality protein by safeguarding its natural resources (www.nfdb.gov.in) Due to a minimum aquatic resources they exploites only at a minimum level and to achive blue revolution we need technologies and awareness on aquaculture farming. Due to a some needs of human welfare,

the aquatic animals are the source of highly nutrient constituents which beneficial to a developmental growth of a human beings. Aqua- culture produces a Aqua food and thus the fishes are considered as one of the most important healthy foods in diets. In this study the main concern is to a Biofloc technology for high productivity of aqua foods, opportunities to provides occupation to employment. Increasing food supply and improves the nutritional status of the people and it earns foreingn exchange. Now a days using this advanced technologies to achieve high yield in fish production. As we know that aquaculture is popular in India. Their are 60% of indians eat fish as a part of their regular diet. The fish demand in market is high; its price is also very high which insures a good income.

The recent studies and according to some research articles can be suggested that, Bisfloc Technology (BFT) in Aquaculture farming offers So many benefits in improving the productivity of aquaculture. The acheivement of sustainable development goals their is a contribution of aquaculture production. The BFT results higher productivity with less impact to environment, because this is environment ecofriendly "in situ" type of aquaculture technique and the food is recycled and reused to fish as a feed, with rich protein and to maintains a coast of Standard fish feed. According to Food and Agriculture Organization (FAO), hypothetically we are conclude that fishes are one of the most essential nutritious diet, they can word off a number of lifestyle aliments of consumed regularly in moderation. Fishes have been an essential part of our body since 97% of earth is water humans depend greatly on fishes for their dietary requirements. Their great variety, easy avilability and their nutritional Content have made them a great choice of food.

Objectives

- To find out the survey of water bodies & selection of site.
- To study popularise new culture practices in the aquaculture and biofloc aqua farming technology (BFT).
- To study biofloc water quality analysis (Physicochemical Parameters) of water, water quality management of bioflocs (BFT) and biofloc fish yield parameters.
- To study the selection of suitable fish species in biofloc and biofloc culturing method, experimental setup of biofloc pond formation.
- To study enhance the growth performance and survival rate of the produced fish in biofloc pond.
- To study biochemical analysis of fish.
- To disseminate suitable technology for innovative aquaculture practices and harvesting aquaculture product.
- To study the annual productivity of aquaculture, advantages and disadvantages of biofloc technology.

Yearly Work Plan

Sr.No.	Year and Proposed Work
	First Year
1.	Review of literature survey .
2.	Survey of finding water bodies and selection of site.
3.	Analysis of Physicochemical Parameters of water.
4.	Compilation of data and statistical analysis.
5.	Submission of progress report (6+6 months).
	Second Year
1.	Selection of species in biofloc pond
2.	Biofloc culturing methods and Experimental setup.
3.	Biochemical analysis of fish.
4.	Compilation of data and statistical analysis.
5.	Publication of research papers in Conferences.
6.	Submission of progress report (6+6 months).
	Third Year
1.	Culturing and harvesting of Aquaculture product.
2.	Annual production of aquaculture.
3.	Advantages and disadvantages .
4.	Compilation of data, Six monthly submission of progress report.
5.	Presentation and publication of research paper, Pre-Ph.D. synopsis submission.
6.	Thesis submission.

Materials and Methods

Water is the most important resource for all organisms on earth, especially for cultuerable aquatic organisms such as fishes, prawns, oyster, Pearl, oysters, carb, and shrimps etc. It is very essential for a all aquatic life's. In Biofloc technology (BFT) is a new technique of aquaculture. It is also called as a blue revolution in aquaculture. The BFT technique which is totally based on a 'in-situ' type of culture. In Biofloc technology(BFT) is in-situ microorganism production technology . Microorganisms plays a very important role in biofloc such as maintenance of water quality ,nitrogen compounds generating microbial protein by in situ and nutrition, by reducings feed conversion ratio (FCR) which increasing the culture feasibility and decreases a coasts of feed. The bioflocs are aggregates the natural source of food avialable in situ which is a rich protein-lipid. The natural Productivity of pond which depends on role of recycling nutrients and maintaining the water quality parameters, importance of the carbon-to- nitrogen (C:N) ratio in the culture media.

Physicochemical Parameters of water sample can be analyzed by season wise. The estimating parameters like turbidity, hardness, dissolved oxygen(DO), Dissolved cobon-dioxide, nitrate, chloride, total solids & total dissolved solids will be studied by using standard methods as prescribed by APHA (1995, American public health Association) and OCED (2007, Organization for economic coperation and Development), found with the limit or below water quality analysis as per the guidelines and the results will compared to WHO and ISI.

Biochemical composition of fishes contains the some several major biomolecules which present in edible fishes; which are essential for fish growth and survival of fishes such like water, Protein, fat and minearls etc. To Study this, estimation of protein will carried out by Lowry et.al. (1951), Estimation of lipids by Bernes and Blackstok (1973), Vitamin C is an very essential Constituent involved in repair of tissue So, Ascorbic acid test will estimated by according to Roe (1967), and cholesterol by kolmer et. al (1951). Aquatic organism respiration through the dissolved oxygen present in water, so the estimation of dissolved oxygen(DO) by using winkler's azide method (Hach,2015) for oxygen consumption of fish. Generally aquatic organisms are excretes nitrogenous waste in the form ammonia, that's why they are ammonotelic in nature, hence ammonia will be determined by (Solorzano,1969). The present study deals with only water quality analysis of physicochemical Parameters of water and Biochemical analysis of fish.

Importance of study:-

- **International status:**

The present research is deals with the study of Biofloc technology (BFT) is used in sustainable aquaculture throughout the world. Within the International status of the study, the world aquaculture society will be developed through its commitment to excellence in science, technology, education and information exchange will contribute to the progressive and sustainable development throughout the world. Through aquaculture, our oceans, seas and inland fresh waters hold huge potential to provide us with increased amounts of healthy and nutritious food. This is needed to feed an ever growing human population so aquaculture helps us with our 'food security' and also helps to increase the worlds economy.

- **National status:**

The National status of biofloc technology (BFT) plays an important role in Indian economy. India is also an important country that produces fish through aquaculture in the world. India is home to more than 10% of the global fish diversity . Presently, the country ranks second in the world in total fish production with an annual fish production of about 9.06 million metric tonnes and 4th largest exporter of fish and fisheries products taking brand India from local to global and helps to increase the Indian economy.

- **Regional status:**

The regional status of aquaculture in local areas helps to produce sustainable aquaculture and socio-economic development in local economy. The farmed fish provides high quality protein for human consumption. Fish farming can be integrated into the existing farm to create additional income and improve its water management. Buying local reduces the number of miles your fish have to travel and may help to reduce the transportation stress on live fish. Thus fish culture can greatly contribute to the socio-economic welfare of rural populations of especially developing countries. It helps to increase the world & Indian economy and produces employment.

- **Scope of study:**

The present study will give the information about new innovative culture practices in aquaculture, and how to utilized the aquaculture resources for aquaculture purposes. The food demand increasing , green revolution in the world has provided the food for huge population in the world but for healthy life there is atmost need of animal proteins for young generations; aquaculture is the best option to fulfil the need. Like, Socio-economic development, export of aquaproduct and foregin exchange, develops business, industry, employment etc. Aquaculture will helful for agriculture and aquaculture education, extension and research.

Expected Outcomes

The present study will confer that the new technology in Aquaculture which is very essential for the culture of aquatic animals in Biofloc pond/tanks which aggregates microorganism and provides the proteinous feed for fish it self, which is benificial to the fish growth because the fish also needs balanced and a nutritious diet for their enhancing the growth of fish and also Survival rate of fish. In Biofloc Technology (BFT) is a in situ or environmental ecofriendly techniques in Aquacultural animals for their susitainable development in Aquaculture.

Biofloc fish farming will reduces the impact of Environmental ecosystem. In this tenchnique nutrients can be continuously recycled and reused in the cultural pond and produces the higher Productivity. It helps to the enchancing survival rate and growth performance of a biofloc fish. In this culture systems of fish their is conversion of feed, which is protein rich feed and reduces the utilization of coast of standard feed. In this culture medium cultivable fishes have higher biosecurity. It is also be benifeted by low zero- minimum water exchanges, so in this technique their is a conservation of natural resources. In minimum water resource, produces the higher productivity. Demanad of animal proteins is increases year by year so it is a challenge to provide quality protein in expected population. Fishes are one of the most nutritious diet, they can ward off a number of life style aliments if consumed regularly in moderation, so in this study the special plan for higher productivity in aquaculture to produces a higher quality of aqua food, which is rich in protein. Aquaculture plays a key role in human health to promotes growth by Providing animal protein, economic growth and generating the employment because it is essential to awareness about Aquaculture in future generations and quality of water resources in Biofloc pond.

Benefit to Society

Aquaculture is one of the most important and popular business in the World as well as our India. The Aquaculture plays a very important role in Economic development such as aquaculture generates employment, It improves nutritional status of the people, It increases the food supply and earns the foreign exchange. During the study we learns about the importance of aqua culturing animals like fishes, Prwans, edible oysters, pearl oysters , shrimps etc. Aquaculture and aquatic organism are essential for human welfare. It provides protein rich aqua food, opportunity to employment, sewage water is useful for aquaculture, It produces ornamental fishes. In India culture and capture fisheries will have important role in Inland fisheries (fresh water fisheries) and marine water (mariculture) fisheries.

The present study is directly concern to the ‘Blue revolution' in Aquaculture and also the awarness about new technologies in Aquacultural practices. Now a days recently, The new trends in aquaculture developes a Biofloc fish culture technology (BFT) because the global population is expected to rich 9.6 billion by year 2050 and their is a challenge to provide quality protein to the future generations. Biofloc production can be increase growth performance and survival rates in the cultured species. It is also decreases fish mortality rates. The biofloc Technology improves water and land use rates, it is also benificial to perform a key advatages of Biofloc farming such as, it used lesser water and produces higher

productivity. The Nitrogen waste is converting into Protein and useful for fish feed. The Aquaculture is essential for the sustainable development of every organism. Aquaculture is useful for educational and scientific purposes. Day by day the human population in the world is increasing specifically in some parts of the world like Asia and Africa continent the growth of population is increasing with explosive rate. Food demand is increasing, green revolution in world has provided the food for huge population in the world but for healthy life, there is at most need of animal proteins for the young generation; fish is the best option to fulfil the need. Fish as a food for human beings, it's benefits to health. The edible fish contains; water 65-95%, Protein 10-22%, fat 1-20% and minearls 0.5-0.5% and also presence of carbohydrates, vitamins, Nucleotides, other non proteinaceous nitrogen compounds are also present in small quantities. Eating fishes improves immunity which helps in fighting infections. Being good source of calcium, fishes are beneficial food to good healthy bones and muscle growth. Fishes are considered as one of the most heart healthy foods.

Now in observational studies have shown that people who eat fish regularly have a lower risk of heart attacks, strokes and death from heart disease. Fishes and fish oils help to treat depression and anxiety. As good source of vitamin E and omega-3 fatty acids, they are good for healthy skin and hair. Certain fishes like Tuna protects skin and kidneys against infections. They also reduce the risk of breast, colon and kidney cancer. They promote the development of body and muscles. They aid in improving blood criculation and metabolism and also help to reduce blood pressure. They help to pray prevent inflamenatory diseases such as Arthritis, osteoporosis and Gout. Fishes like Tilapia and many others are beneficial in weight loss. Fishes are one of the most nutritious diet, they can ward off a number of lifestyle ailments if consumed regularly in moderation. Fishes have been an essential part of our food since 97% of earth is water humans depend greatly on fishes for their dietary requirements. Their great variety , easy availability and their nutritional content have made them a great choice of food.

The study will directly concern with a fish fish culture and to provide a quality of protein rich food. The Present study also includes a plan of Scope of Aquaculture like Aquaculture and agriculture, Aquaculture and industry Aquaculture and business Aquacultuɛe and employment, export of Aqua product and foreign exchange, Aquaculture education, extension and research, and Aquaculture and social development which is essential for sustainable development of socio-economic development in an Aquaculture.

Conclusion

The study of Aquaculture farming of aquatic organisms in a biofloc ponds which is carried out by a Biofloc technology (BFT), In this new technique of cultural practices in aquaculture farming it is benificial to the aquatic animals because in this technique the aggregation of a microorganism can formed a floc and produces the highly proteinous feed for fish. which is readily available culture medium (pond) . The biofloc technology is in-situ type of aquaculture. This technique is very famous in brackish water aquaculture, especially

the farming of shrimps and produces the high productivity as like this is ‘sun rise sectors’ in India. In presence study we conclude that this technique plays essential role in socio-economic expansion. The aquaculture production in world has increases almost 12 times. In this study we conclude that biofloc fish farming is very useful technique for high quality fish production.

The proposed study not only includes the fish production technology in fresh water resources but also analyzed the water quality parameters of culture medium, because water plays a vital role in Aquatic farming and the presence water, in cultural pond, is it? suitable for a fish or not. The productivity is also influenced by physicochemical parameters, so the assessment of water sample of biofloc pond and control pond is seasonally analysis to check water quality. It's physicochemical analysis includes temperature, PH, turbidity, alkalinity, dissolved oxygen, hardness, salinity, chlorides, nitrates, total solids & total dissolved solids, by which the water quality of pond can be checked. The proposed study is aimed to find to out physico-chemical parameters which is suitable for aquatic life or not. Dissolved oxygen is essential for respiration process, so in biofloc ponds the high density of stocking seeds have presence a lack of oxygen is present; so we conclude that there is need of air oxygen supply in pond by airators, as like aquarium fishes. Because of this, the fish species can be selected for the biofloc fish culture are air breathing fishes like singhi, magur, padba, Anabas/koi, Pangasius and non-air breathing fishes such as Common carp, rohu, tilapia, milk fish, shellfishes like vannamei and tiger shrimp etc. Further, these fishes cultured in biofloc which depends on readily avilable fish feed in culture pond, to add probiotics in floc for protein rich feed, and also study the growth performance and survival rate of fish in biofloc pond as well as control pond.

According to this study we conclude that the biofloc pond fish is grows rapidly and contains the high quality protein as compared to control pond fish. For enhancing growth Performance of a fish when maintain C:N ratio in a biofloc pond. In another step of proposed work, we studied the Biochemical analysis of fish by some standard methods, in this estimation of protein, lipids, water, fat and minearls, etc. In biological analysis of fish we conclude that the biofloc fish contains a rich protein content in their nutrient. Now our observational study have shown that fish is a food in regular diets, and their are various benefits to the human beings. Due to this study the demand of animal protein, we succeed to provides a high quality protein to future generations in the expanded global population and achieve a blue revolution and awareness in new technologies on Aquaculture.

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